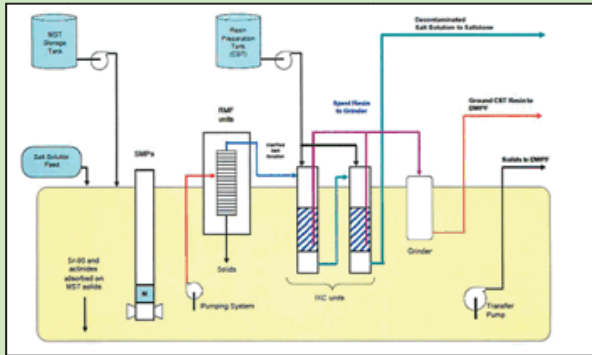


External Technical Review Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

Small Column Ion Exchange Technology at SRS

Why DOE-EM Did This Review



Baseline SCIX System Process Diagram

The Small Column Ion Exchange (SCIX) system is being developed at SRNL for use on high level waste. The SCIX system is composed of a series of unit operations (ion exchange, filtration, sluicing, grinding) which function to remove targeted radionuclides (Cs, Sr, and actinides) from the salt waste portion of the waste and prepare these for disposal in glass. Several critical technology elements have been identified within the SCIX system that pose a risk for successful deployment and these were the subject of this review. Specifically the critical technologies include: Cs ion exchange on a selective resin (crystalline silicotitanate [CST]) housed in an in-tank riser, grinding of the spent CST, actinide and Sr ion exchange on a resin (monosodium titanate) dispersed in the transfer tank, and solids/liquid separation by rotary microfiltration (RMF). The objective of the review was to assess the maturity of the SCIX technologies to determine the readiness of the process for completion of conceptual design, and to provide the program confidence in moving towards detailed design.

What the ETR Team Recommended

The review team identified several "areas of concern" and provided the following recommendations to address these:

- validate the CST surrogate used in grinding tests,
- accelerate testing of the highest risk individual critical technologies and perform integrated system tests using representative stimulants,
- model fluid flow through the system, with particular emphasis on flow between RMF and CST column (use integrated tests to validate),
- validate modeling (ideally with experimental tests) the thermal effects in the CST column,
- identify disposal plans for failed/spent equipment,
- close issues identified in Preliminary Consolidated Hazard Analysis,
- include schedules and rough cost estimates in maturation plan, and
- ensure that feed preparation and saltstone throughput risks are appropriately identified in risk documents, program schedules, and system plans.

What the ETR Team Found

The ETR team concluded that the SCIX system is mature enough for conceptual design and deployment by the end of 2013 is achievable, although this is an aggressive schedule. Technology risks were identified; however, these can be mitigated with appropriate testing and evaluation. The ETR team believes the greatest risks to the program are schedule related, notably procurement of long-lead items like RMFs and requiring higher productions rates in tank farm operations.

To view the full ETR reports, please visit this web site:
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

ETR Summary: September 2011

The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.



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